REMARKS

The Examiner's action dated December 13, 2004, has been received, and its contents carefully noted.

Claims 5, 7 and 9 have been canceled. Claims 1-4, 6, 8 and 10 are pending. It is noted that the Office action Summary refers incorrectly to claims 2-4, 6, 8 and 10.

In order to advance prosecution, claim 6 has been amended only to eliminate a possible source of misunderstanding. As will be explained in detail below, claim 6, as now amended, clearly distinguishes over the applied reference.

The rejection of the claims as unpatentable over Al-Salameh (the '820 reference) is traversed for the reason that the novel method and system defined in these claims is not disclosed in or suggested by the applied reference. In fact, as will become more readily apparent from the discussion to be presented below, the '820 reference actually teaches away from the present invention.

A basic feature of the present invention is that the diversion of communication traffic from first optical transmission and reception links to second links is based on a fault detection, such as a loss of signal determination performed at each location where switching must occur. This is defined in claim 1 in terms of determining that total

energy is below a threshold and in claim 6 in terms of detecting a fault. In clear contrast, and as will be explained in greater detail below, the '820 reference teaches making the necessary determination and switching to a protection path at a first location and then not switching at a second location until a signal is detected on the protection path.

A significant advantage of the present invention is that it results in a significantly more rapid switch to the protection path, or link, at both locations.

By the method described in the '820 reference, when a loss of signal (LOS) is detected at the node located at a first end of a link, the traffic from that link is switched to a protection path. However, the corresponding switching that must take place at the second node (the one located at the second end of the link), is performed only after the detection means of that second node is able to detect the arrival of traffic along the protection path. In connection with this point, it is noted that column 2, lines 29-32 of the reference simply disclose that a loss of signal detection to route a copy of its outgoing signal in a direction away from the fault. It is clear from the entirety of the paragraph at column 2, lines 26-43 that this is different from supplying the incoming signal to a protection capacity port.

In contradistinction to this method, by the method of the present invention the corresponding switch at the second node would be carried out independently at the second end of the link after having detected a LOS thereat.

In order to better understand the quite significant difference between the two methods and the advantages offered by the solution of the present invention, let us consider a ring configuration as described in the '820 reference. In this ring, "upon detecting a loss of optical signal on incoming service capacity port, the node autonomously switches its optical switch matrix configuration to route a copy of its outgoing optical signal in a direction away from the fault. Then, upon detecting the presence of an optical signal on an incoming protection capacity port, the node autonomously switches its optical switch matrix configuration to supply the optical signal incoming on the protection capacity port... Upon a change from no signal to detection of signal at the protection capacity input port, the node autonomously switches the switch matrix to pass the detected optical signal through to a protection capacity output port." (col. 2 lines 29 to 44). Now, let us assume that these two nodes are located some 10-20 km apart from each other while the whole ring is a few hundred km long. The minimum time that would be required for the second node of the' 820 reference to switch the traffic to

the protection path is equal to the sum of the following: a) the time required for the first node to switch to the protection path plus b) the time required for traffic to pass the full length of the ring (less the distance extending between these two adjacent nodes) plus c) the time required for identifying the presence of traffic at the protection port of the second node plus d) the time required for the second node to switch to the protection path. Only then traffic may be conveyed properly along the protection link, and all traffic that was transmitted along the faulty main link during the time needed to complete switching is lost.

According to the present invention, the traffic leaving the first node is diverted to the protection link upon detecting a LOS at that first node. Consequently, the second node would not receive the expected traffic along the main link, which amounts to a LOS. In response to the detection of LOS at the second node, traffic will immediately be diverted at that second node to the protection link, independent of whether the first node has already affected a switch to the protection link, or not.

Thus, the whole process is clearly different from, and substantially faster than, that disclosed in the '820 reference and allows much more stricter requirements to be

met, *e.g.*, to complete the whole switching process within a few tens of msec.

In addition and to further understand the difference between the two methods, let it be assumed that there is a need to convey low priority traffic along the protection link while normal traffic is conveyed along the main link, in order to better utilize the available network. This implementation is simply impossible if one were to use the '820 reference method, as in such implementation there will always be traffic arriving at the protection port, causing the second node to switch the traffic that should be conveyed along the main link to the protection link for no good reason, while the first node is still transmitting traffic along the main link.

By the method of the present invention, the receipt of the low priority traffic at the protection port of the second node would have no effect upon the normal operation, and if there arises a need to switch to the protection link, the low priority traffic may simply be displaced.

In addition, the whole process described in the '820 reference will be initiated only upon determining that a loss of signal (LOS) has occurred. One of the ways to determine the LOS is found in the paragraph to which the Examiner referred in the Office Action, as it was "recognized that when a LOS has not occurred, the in-band signal level is

approximately 60 times larger that the out-of band signal. When a LOS has occurred the in-band signal level is approximately 40 times as large as the out-of-band signal level" (col. 11 lines 27 to 31). The present invention on the other hand, requires that the switch at each end of the link occur when less than a predefined amount of energy is detected, not necessarily under LOS condition. Thus, the method of the present invention allows the diversion of traffic associated with certain faulty channel(s) to the respective protection link, while the traffic of the remaining channel(s) may still be conveyed along the original path (as claimed in claims 6, 8 and 10 of the present application).

Thus claim 1 clearly distinguishes in an unobvious manner over this reference at least by the following recitations:

> determining whether a total of the energy received over a first optical link at the second location exceeds a pre-defined threshold;
>
> in the case that the total energy thus received does not exceed the pre-defined threshold, diverting the traffic transmission and reception at the second location to the corresponding second links;
>
> determining whether a total of the energy received via a first optical link at the first location exceeds a pre-defined threshold; and

in the case that the total energy thus received at the first location does not exceed the pre-defined threshold, diverting the traffic transmission and reception at the first location to the corresponding second links.

It should be readily apparent from the discussion presented above that these steps are not suggested by the applied reference and, in fact, constitute a procedure that is contrary to the reference teachings. The Examiner has not cited any prior art evidence of a possible motivation by those skilled in the art to modify the procedure disclosed in the reference.

Similarly, claim 2 clearly distinguishes in an unobvious manner over this reference at least by the following recitations:

detecting a fault on at least one of the channels carrying traffic in normal operation mode, at the second location;

switching at the second location the transmission and reception paths associated with said at least one failing channel to the at least one protection channel;

detecting a fault on said at least one channel at the first location; and

switching at the first location the transmission and reception paths associated with said at least one faulty channel to the at least one protection channel.

Thus, in each of claims 1 and 2, a detection or a determination is made at each location to control diversion, or switching, at **that** location. This is simply beyond any suggestion that can be inferred from the '820 reference.

Claim 6 distinguishes over the applied reference at least by the following recitation:

> wherein in response to a detection of loss of signal in said at least one forward channel, traffic designated to be transmitted along said at least one forward channel is diverted to said at least one protection link at each of the first and second locations.

Thus, claim 6 clearly specifies that diversion of traffic to the protection link occurs at both the first and second locations in response to a detection of loss of signals in the forward channel. It should already be clear from the explanations presented above that, in the applied reference, diversion at two locations is not in response to a detection of loss of signal.

Accordingly, it is requested that the prior rejections be reconsidered and withdrawn, that all of the pending claims be allowed and that the application be found in allowable condition.

In the present case, if the above amendment does not place the application in condition for allowance, it is desired to seek a personal interview with the Examiner to discuss this matter. In that event, it is asked that the Examiner contact undersigned counsel to arrange such interview.

Respectfully submitted,

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